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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,372	07/09/2003	Graham Sparcy-Taylor	005092.00040	1222
22910	7590	02/15/2006	EXAMINER	
BANNER & WITCOFF, LTD. 28 STATE STREET 28th FLOOR BOSTON, MA 02109-9601			SOOHOO, TONY GLEN	
			ART UNIT	PAPER NUMBER
			1723	

DATE MAILED: 02/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/616,372

Applicant(s)

SPAREY-TAYLOR ET AL.

Examiner

Tony G. Soohoo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
4a) Of the above claim(s) 44-54 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-43 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

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DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, via the telephone restriction with P. McDermott on 5-19-2005 with traverse and responded to in the present reply filed 12-07-2005 on is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim interpretation

2. With regards to claims 36-39, the claim points out the junction "is operative at fluid pressure ... of at least [a specific amount of] psi". The claims are directed to the function of the device and thus affords no patentable distinction to the structure of the junction itself.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al 6244738 in view of Khuri-Yakub et al (Khuri-Yakub) US 2002/0083711 (both cited on PTO 1449).

With regards to at least claim 1, The Yasuda (et al 6244738) reference discloses a body having a 1st duct 21, 2nd duct 22 and ultrasound transducer 48, 42, 43, 32 which may be operated at any wavelength in correspondence as desired toward the other boundary of the fluidic junction. The Yasuda reference also teaches the use of the manifold in combination with a further fluidic component 52 integral with the manifold body.

The Yasuda reference discloses all of the recited subject matter as defined within the scope of the claims with the exception of the channel width of the junction being not more than 300 microns.

The reference to Khuri-Yakub et al US 2002/0083711, discloses a microchannel in which an acoustic field is provided by transducers 37 in which the channel boundary may be made in the size down the range of 1 micron, page 2, [0023], and see claims 2, 5. Also in the art of fluid handling, the size of the fluid channel is a direct variable in the amount of flow that the device may process.

In view of Khuri-Yakub et al US 2002/0083711, it is deemed that it would have been obvious to one of ordinary skill in the art to change the size of the channel of Yasuda with techniques gleaned from the Khuri-Yakub reference such that the channel is of an appropriate size such as 1 micron so that the produce a more precise amount of fluid flow to be processed, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955).

With regards to the particular fluid-handling component operative on the manifold body of claims 3-20, and 43 it is noted that micro components of transducers, mixers, condition sensors, temperature sensors, pressure sensors, optical sensors, flow rate sensors, dielectric constant sensors, viscosity sensors, turbidity sensor, micro valves, fluid pumps, heaters components, cooler components, are all old and well known in use in combination with a microchannel in the art of microfluidic processors, absent any unexpected result in the fluid processing produced by such devices, whereas the Yasuda reference teaches that another fluidic component 52 may be used in combination with the manifold, it is deemed that it would have been obvious to one of ordinary skill in the art to substitute for the Yasuda reference with another fluid component in combination with the manifold so that the fluid may be processed in an additional manner by the respective additional fluidic component processor.

With particular regards to claims 21-24, 28, 32-33, 35, 41-42, the claimed production technique (i.e. laminate, monolithic), channel or junction shape, and type of materials of micromixer device as recited in the claims, absent any unexpected result to the type of manufactured material in which the manifold channel is produced, it is deemed that it would have been obvious to one of ordinary skill in the art to substitute the material of the manifold body 1, 16 with any material or change the material channel configuration such as plastic, transparent glass, or ceramics, or silica, or shapes of T, circular, square or triangle sections so as to produce a more cost effect manner to provide a channel surface in which the manifold resides. It has been held to be within the general skill of a worker in the art to select a known material on the basis of its

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suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416, and a mere change in form or shape on the basis of suitability is a matter of obvious mechanical design choice. In re Dailey, 149 USPQ 47 (CCPA 1976).

With particular regards to claims 25-27, and 29-31, with regard to the type of transducer to produce the ultrasound wave, the use of piezoelectric, magneto-restrictive, electrostatic, and thermostatic transducers are all commonly known functional equivalents to produce wave energy. Accordingly, it is deemed that it would have been obvious to one of ordinary skill in the art to substitute for the ultrasound vibrator with any functional equivalent transducer device in order to ease and lower construction costs.

With regards to claims 36-39, the claim points out the junction "is operative at fluid pressure ... of at least [a specific amount of] psi". The claims are directed to the function of the device and thus affords no patentable distinction to the structure of the junction itself.

Response to Arguments

5. Applicant's arguments filed 12-07-2005 have been fully considered but they are not persuasive.

Applicant argues that the functional recitation of claim 36 of "the manifold body is operative at fluid pressure in the microfluidic junction greater than 25 PSI" should be given patentable weight. In response, the phrase has been given patentable weight and has been deemed as providing little structural distinction to the claim. The phrase is read as merely requiring a positive structure of a manifold body and a microfluidic junction. It is deemed that any manifold body or junction may be structurally capable of operating in such a regime. Thus such operative characteristics is merely deemed as

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being directed an inherent characteristic of any manifold or junction. "the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. Whether the rejection is based on 'inherency' under 35 U.S.C. 102, on '*prima facie* obviousness' under 35 U.C.S. 102, jointly or alternatively, the burden of proof is the same." *In re Fitzgerald*, 205 USPQ 594 (CCPA 1980) (quoting *In re Best*, 195 USPQ 430, 433-434 (CCPA 1977)). It is noted "where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied upon" *In re Swinehart* 169 USPQ 226, 229 (CCPA 1971).

As explained in *In re Schreiber* 44 USPQ2d 1429 (CA FC 1997): "A patent applicant is free to recite features of an apparatus structurally or functionally. [] Yet, choosing to define an element functionally, *i.e.*, by what it does, carries with it a risk. As our predecessor court stated in *Swinehart*, 439 F.2d at 213, 169 USPQ at 228: where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied upon".

Applicant, on the top of page 14 of the remarks, makes an unsupported statement that the combination of Yasuda (et al) reference in view of the Khuri-Yakub

(et al) reference that does not show the language of claim 1. Absent any particular reference to the deficiencies of the prior art in comparison to the elements of the claim language, the statement is unpersuasive.

Applicant further on the bottom of page 14 of the remarks, argues that the combination of Yasuda (et al) reference in view of the Khuri-Yakub (et al) reference can not be properly combined. Applicant argues that the Yasuda reference is a stirrer using ultrasonic vibrators in a microtube and states that Yasuda does not state any size of the microtube. Applicant further argues that Khuri-Yakub teaches a micromachined ultrasonic transducer for replacement of traditional larger ultrasonic devices. Thus applicant alleges that a conclusion should be made that Khuri-Yakub teaches away from combining its device with a microfluidic system of Yasuda et al since they are incompatible.

In response, applicants argument so the particular type of ultrasonic transducers being cMUTs are immaterial to the patentable novelty of the instant claims whereby the claims do not point out the relative size and bulkiness details of the ultrasonic transducer. Applicant's allegation that since the references utilized different ultrasonic devices there must be a conclusion that they teach away from each other is unpersuasive. The secondary reference to Khuri-Yakub et al has been applied as a teaching to a modification of the micro-channel or micro-capillary structure. Applicant's argument that the Khuri-Yakub reference states that a particular ultrasonic device is "bulky, and cannot be easily integrated to microfluidic systems" does not establish that

such a modification is impossible, but merely difficult. A statement of "difficulty" does not establish a finding of fact of teaching away from one another.

Applicant further alleges that with regards to the depending claims as pointed out in pages 15-19, that the prior art does not teach or suggest such a feature. The statements allegation of deficiency of the prior art without particular references to the text or drawings of the prior art as evidence of such deficiencies is unpersuasive.

Conclusion

6. The previously cited prior art made of record in the last office action is reiterated in a listing in the conclusion since it is considered pertinent to applicant's disclosure. Cargill et al Re.26605 shows a junction with sonic application. The following disclose ultrasonic devices: 3144037, 4339247, 4879011, 5779985, 6010316, 6045208, 6065350, 6100084, 6234765, 6368871, 6413783, 6506584, 6649069, 6719449, 6777245, 6840380, 3396286.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony G. Soohoo whose telephone number is (571) 272 1147. The examiner can normally be reached on 7-5PM, Tue-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Tony G Soohoo
Primary Examiner
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